



## Physical Fitness Levels Of Female Athletes In The Handball Student Activity Unit (Ukm) At Riau Islamic University

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### Abstract

Physical condition is a major factor in supporting the performance of handball athletes. This study aims to determine the level of physical condition of female athletes of the Handball UKM of the Islamic University of Riau. The study used a quantitative approach with a descriptive method. The sample consisted of 20 athletes with a total sampling technique. The research instruments included arm and shoulder muscle strength tests (hand dynamometer), arm and shoulder muscle endurance tests (push-ups), speed tests (50-meter run), agility tests (shuttle run), and general endurance tests (15-minute run). Data analysis used descriptive statistics in the form of percentages and norm categorization. The results showed that the average level of physical condition of athletes was 5.2 which was in the sufficient category (80%). The dominant component was arm and shoulder muscle endurance (65% in the very good category), while the lowest component was general endurance (75% in the poor category). It was concluded that the physical condition of female athletes of the Handball UKM of the Islamic University of Riau still needs improvement, especially in the aspect of cardiovascular endurance.



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## INTRODUCTION

Handball is a team sport characterized by intermittent high intensity, requiring a simultaneous combination of aerobic and anaerobic performance (Hermassi et al., 2020; Póvoas et al., 2021). Handball involves repeated sprints, explosive jumps, rapid changes of direction, and physical contact, thus demanding comprehensive physical conditioning (Wagner et al., 2022).

Physical fitness in handball consists of strength, endurance, speed, agility, and power as the main biomotor components (Granados et al., 2020; Mancha-Triguero et al., 2021). Cardiovascular endurance plays a crucial role in maintaining game intensity throughout the two halves of a match (Michalsik & Aagaard, 2020). Athletes with low aerobic capacity tend to experience a significant decline in performance in the final phase of a match (Póvoas et al., 2021).

Furthermore, arm-shoulder muscle strength and endurance significantly determine the effectiveness of shooting and passing in handball (Hermassi et al., 2021). Agility is also an important indicator because it relates to the ability to change direction and tactical responses in game situations (Nimphius et al., 2020).

Recent research has shown that the physical condition profiles of female athletes differ from those of male athletes, particularly in anaerobic capacity and absolute strength (Haugen et al., 2020; Dos'Santos et al., 2021). Therefore, a

specific, data-driven evaluation of the physical condition of female athletes is essential.

At the university level, research on the physical condition profiles of handball athletes is still limited, particularly in Indonesia. Local studies have focused more on soccer and volleyball (Pratama & Yuliawan, 2022; Sari et al., 2023). The lack of empirical data on the physical condition of female handball athletes represents a research gap that needs to be filled.

Systematic physical condition evaluation can form the basis for developing evidence-based training programs (Turner et al., 2022). Therefore, this study aims to determine the physical condition levels of female athletes in the Handball Student Activity Unit of the Islamic University of Riau.

## METHODS

This study used a quantitative approach with descriptive methods. The subjects were 20 female athletes from the Riau Islamic University Handball Student Activity Unit, using a total sampling technique. Research Instruments : 1. Hand Dynamometer, 2. Push-Ups, 3. Speed Test (50-meter Run), 4. Agility Test (Shuttle Run), 5. Endurance Test (15-minute Run). Data analysis techniques use descriptive statistics in the form of frequency, percentage, and average, then classified into the categories of very good, good, sufficient, and less.

## RESULT

The results of the study showed that: 1. The majority of arm and shoulder muscle strength was in the sufficient category (40%). 2. Arm and shoulder muscle endurance showed predominantly very good results (65%). 3. Speed was in the sufficient category (40%). 4. Agility was mostly in the good category (35%). 5. Endurance was in the poor category (75%). Overall, the average physical condition score for athletes was 5.2, which is in the sufficient category (80%).

These results indicate that local muscle strength is relatively good, but aerobic capacity is still low. In the context of handball, which demands rapid transitions and high intensity over two halves, cardiovascular endurance is a crucial factor.

This is in line with research by Hermassi et al. (2021), which states that female handball athletes tend to have good local muscle endurance due to adaptation to repetitive technical training such as passing and shooting

## DISCUSSION

However, the general endurance component showed a low score (75%). This finding is consistent with research by Póvoas et al. (2021), which explains that female athletes' VO<sub>2</sub>max capacity is often a limiting factor in match performance. Michalsik & Aagaard (2020) also stated that handball performance is significantly influenced by the ability to maintain repeated running intensity.

Low aerobic endurance can impact shooting accuracy and the

effectiveness of game transitions in the second half (Granados et al., 2020). Therefore, increasing aerobic capacity through high-intensity interval training (HIIT) and small-sided games is recommended (Mancha-Triguero et al., 2021; Turner et al., 2022).

The speed and agility components are in the fair to good category. This indicates that the athlete has adequate neuromuscular abilities, but still needs to improve explosiveness and repeated sprint ability (Haugen et al., 2020; Dos'Santos et al., 2021).

Overall, the physical condition profiles of the athletes in this study showed a similar pattern to university-level handball athletes in international studies, with a predominance of localized strength but relatively weak general endurance (Wagner et al., 2022).

The practical implication of this research is the need for periodized training that emphasizes increasing aerobic capacity without neglecting strength and power.

This finding is in line with previous research which shows that student-level handball athletes are generally in the moderate category in terms of physical condition components and require improvement in the general endurance aspect. The practical implication of this research is the need for structured aerobic training programs such as interval training, circuit training, and small-sided games to increase athletes' VO<sub>2</sub>max capacity.

## CONCLUSION

The physical condition of the female athletes from the Riau Islamic University Handball Student Activity Unit (UKM) is considered adequate, with an average score of 5.2. The dominant component is arm and shoulder muscle endurance, while the lowest component is general endurance. Increasing aerobic capacity is a priority in the next training program.

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